

REMARKS

Upon entry of the foregoing amendment, claims 2-4, 8-10, 12, 13, 15, 17-20, and 24-30 are pending in the application, with claims 9, 13, 15, 19, and 27 being the independent claims. Claims 5-7, 16, and 21-23 were previously canceled. Claims 1, 11, and 14 are presently canceled without prejudice to or disclaimer of the subject matter therein. Claims 2, 4, 9, 10, 12, 13, 15, 17-20, and 25 are currently amended. New claims 26-30 are presently added. These changes are believed to introduce no new matter, and their entry is respectfully requested.

Based on the above amendment and the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Allowable Subject Matter

Claims 9, 15, and 24

In section 6 of the Office Action, claims 9, 15, and 24 were indicated to be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 9 has been amended accordingly. Claim 15 formerly depended from claims 11 and 14. Claim 15 has been rewritten in independent form to include all of the features of claim 11. Applicants assert that, while amended claim 15 does not include the specific feature recited in claim 14, claim 15 is nevertheless patentable. Claim 24, which depends from claim 9, is patentable for at least the reason that it depends from an allowable claim, and further in view of its own features. Applicants therefore respectfully request that claims 9 and 15 and their dependent claims be passed to allowance.

Objections to the Specification

In section 3 of the Office Action, the Examiner objected to the specification because the first paragraph on page 1 of the specification should be amended to include the patent number of the parent case. Applicants have amended the first paragraph on page 1 of the specification

accordingly. Thus, Applicants respectfully request reconsideration and withdrawal of this objection.

Double Patenting Rejection

In section 4 of the Office Action, claim 1 was rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,765,613 in view of U.S. Patent No. 5,909,026 to Zhou *et al.* (hereinafter “Zhou”). However, claim 1 has been canceled, thereby rendering the double patenting rejection moot.

Thus, Applicants respectfully request that this rejection be reconsidered and withdrawn and that all pending claims be passed to allowance.

Rejections Under 35 U.S.C. § 103

Claims 1-4, 8, 10-14, 17-20, and 25

In section 5 of the Office Action, claims 1-4, 8, 10-14, 17-20, and 25 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,272,535 to Elabd (hereinafter “Elabd”) in view of U.S. Patent No. 5,909,026 to Zhou *et al.* (hereinafter “Zhou”). Applicants respectfully traverse this rejection.

Claim 1, 11, and 14 have been canceled, thereby rendering the rejection of these claims moot.

Claims 2-4, 8, and 10 have been amended to depend directly or indirectly from independent claim 9, which was indicated by the Examiner to be allowable. Applicants assert that claims 2-4, 8, and 10 are also allowable for at least the reason that these claims depend from an allowable claim, and further in view of their own respective features.

Amended independent claim 13 recites, among other features, adding said n amplified pixel signals together to provide a first n -binned signal, and adding said another plurality n of amplified pixel signals to provide a second n -binned signal different from the first n -binned signal, wherein $n=3$.

The Examiner concedes that Elabd does not teach $n=3$. Instead, the Examiner relies on Col. 7, lines 1-8 and 54-67 of Zhou to allegedly teach this feature. However, upon inspection, the cited material in Zhou merely describes a summation kernel having a size of 1x1 pixel, 2x2 pixels, or 4x4 pixels. Zhou, Col. 7, lines 49-59. In Zhou, “[t]he signal in each pixel of a captured frame is sampled and evaluated ... in order [to] determine the summation kernel size for a subsequent frame.” Zhou, Col. 4, lines 29-32. Thus, each pixel has its own signal. Accordingly, a summation kernel of 1x1 pixel corresponds with $n=1$, a summation kernel of 2x2 pixels corresponds with $n=4$, and a summation kernel of 4x4 pixels corresponds with $n=16$. Applicants assert that nothing in the cited material or any other portion of Zhou teaches or suggests *wherein* $n=3$, as set forth in Applicants’ claim 13, as amended.

Thus, Applicants assert that independent claim 13, as amended, is patentable over Elabd and Zhou, alone or in combination.

Amended independent claim 15 recites, among other features, *using at least two separate noise reduction circuits, a first of which reduces noise in a first amplified pixel signal, a second of which reduces noise in a second amplified pixel signal, and said first and second amplified pixel signals being used to form said first n -binned signal, said second amplified pixel signal being retained for use with a third amplified pixel signal later processed by said first noise reduction circuit to form said second n -binned signal*. Applicants assert that nothing in the combination of Elabd and Zhou teaches or suggests this feature.

Thus, Applicants assert that independent claim 15, as amended, is patentable over Elabd and Zhou, alone or in combination.

Moreover, claims 12, 17, 18, and 25, which depend directly or indirectly from independent claim 15, are also patentable over Elabd and Zhou, alone or in combination, for at least the same

reasons set forth above with respect to independent claim 15, as amended, and further in view of their own respective features.

Amended independent claim 19 recites, among other features, wherein said offset reduction circuit is operable to store first pixel values of said plurality *n* of adjacent row pixel values not corresponding to said at least one common element on first capacitor elements for use at the first time, to subsequently store second pixel values of said another plurality of said adjacent row pixel values not corresponding to said at least one common element on said first capacitor elements for use at the second time, and to store third pixel values corresponding to said at least one common row element on second capacitor elements for use at the first time and the second time.

Elabd describes an image sensor in which a register retains charge from one line in an image while charge from the next line in the image is clocked in. The charges from the two adjacent lines are then combined. Elabd, Col. 7, lines 15-18. Zhou describes an integrated sensor including a resolution control circuit that monitors the magnitude of a received signal level from an APS array so that the size of the summation kernel can be determined for a subsequent signal processing. Zhou, Col. 3, lines 63-67.

However, nothing in the combination of Elabd and Zhou teaches or suggests *wherein said offset reduction circuit is operable to store first pixel values of said plurality *n* of adjacent row pixel values not corresponding to said at least one common element on first capacitor elements for use at the first time, to subsequently store second pixel values of said another plurality of said adjacent row pixel values not corresponding to said at least one common element on said first capacitor elements for use at the second time, and to store third pixel values corresponding to said at least one common row element on second capacitor elements for use at the first time and the second time, as set forth in Applicants' claim 19, as amended.*

Thus, Applicants assert that independent claim 19, as amended, is patentable over Elabd and Zhou, alone or in combination.

Moreover, claim 20, which depends directly from independent claim 19, is also patentable over Elabd and Zhou, alone or in combination, for at least the same reasons set forth above with respect to independent claim 19, as amended, and further in view of its own features.

For at least the reasons set forth above, Applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. § 103 and that all pending claims be passed to allowance.

New claims 26-30

Support for new claims 26-30 may be found, for example, at paragraphs [0012], [0016]-[0022], and [0024]-[0028] and Figures 1, 2A, 2B, and 4 of the present patent application.

Claim 26, which depends directly from independent claim 15, is also patentable over Elabd and Zhou, alone or in combination, for at least the same reasons set forth above with respect to independent claim 15, as amended, and further in view of its own features.

Independent claim 27 recites, among other features, *a plurality of capacitor elements, including first, second, third, and fourth capacitor elements, wherein said first and second capacitor elements store respective said first and second pixel signals for said first combined pixel signal, wherein said third and fourth capacitor elements store respective said second and third pixel signals for said second combined pixel signal, and wherein said first and second capacitor elements store respective said third and fourth pixel signals for said third combined pixel signal.* Nothing in the combination of Elabd and Zhou teaches or suggests this feature.

Thus, Applicants assert that independent claim 27 is patentable over Elabd and Zhou, alone or in combination.

Moreover, claims 28-30, which depend directly or indirectly from independent claim 27, are also patentable over Elabd and Zhou, alone or in combination, for at least the same reasons set forth above with respect to independent claim 27, and further in view of their own respective features.

Applicants therefore respectfully request that new claims 26-30 be passed to allowance.

Information Disclosure Statement

Applicants appreciate the Examiner's consideration of the documents listed on the Form PTO/SB/08a/b that accompanied the Information Disclosure Statement filed on February 10, 2004.

Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

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Respectfully submitted,

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